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# Johnson Health Tech. Co., Ltd

# TEST REPORT

**Model:**
Target Training Console-02

**REPORT NUMBER**
240800379THC-001

**ISSUE DATE**
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**PAGES**
13

**DOCUMENT CONTROL NUMBER**
GFT-OP-10h (28-Nov-2018)
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# Maximum Permissible Exposure (MPE) Evaluation Report

| | |
|---|---|
| **Applicant:** | **Johnson Health Tech. Co., Ltd.**<br>**No.999, Sec. 2, Dongda Rd., Daya Dist Taichung City 428, Taiwan** |
| **Product:** | **Console for Exercise Machine** |
| **Model No.:** | **Target Training Console-02** |
| **Test Method/ Standard:** | **FCC 1.1310**<br>**KDB 447498 D01 V06** |
| **Test By:** | **Intertek Testing Services Taiwan Ltd.,**<br>**Hsinchu Laboratory**<br>**No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,**<br>**Shiang-Shan District, Hsinchu City, Taiwan** |

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# Revision History

| Report No. | Issue Date | Revision Summary |
|---|---|---|
| 240800379THC-001 | Sep. 16, 2024 | Change the RFID module. After engineer judgment does not affect other module technologies, no additional tests were considered necessary, then this report are based on Report No.: 210700130THC-001 |

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**Summary of Tests**

**MPE Evaluation meet FCC OET No. 65: 1997, IEEE C95.1-2005**

| Test | Reference | Results |
|---|---|---|
| MPE Evaluation | FCC Guidelines for Human Exposure IEEE C95.1 | Complies |

Note: Please note that the test results with statement of conformity, the decision rules which are based on: Safety Testing: the specification, standard or IEC Guide 115.
Other Testing: the specification, standard and not taking into account the measurement uncertainty.

# 1. General Information

## 1.1 Identification of the EUT

| | |
|---|---|
| **Product:** | Console for Exercise Machine |
| **Model No.:** | Target Training Console-02 |
| **Operating Frequency:** | 1. 2412 MHz ~ 2462 MHz for Wi-Fi 2.4G<br>2. 5180MHz~5240MHz in 802.11a/n(HT20/40)/ac(VHT20/40/80) for Wi-Fi 5G U-NII-1<br>3. 5745MHz~5825MHz in 802.11a/n(HT20/40)/ac(VHT20/40/80) for Wi-Fi 5G U-NII-3 |
| **Channel Number:** | 1. 11 channels for Wi-Fi 2.4G<br>2. 7 channels for Wi-Fi 5G U-NII-1<br>3. 8 channels for Wi-Fi 5G U-NII-3 |
| **Rated Power:** | DC 5V |
| **Power Cord:** | N/A |
| **Sample receiving date:** | 2021/07/09 |
| **Sample condition:** | Workable |
| **Test Date(s):** | 2021/08/11 |

## 1.2 Antenna description

**Antenna 1**

Antenna Gain : 3 dBi
Antenna Type : Unipolar Antenna
Connector Type : I-PEX

**Antenna 2**

Antenna Gain : 3 dBi
Antenna Type : Unipolar Antenna
Connector Type : I-PEX

### 1.3 Peripherals equipment

| No. | Model no. | Specification |
|---|---|---|
| Adapter | GS18U05 | I/P: 100-240V~,50/60Hz, 0.5A<br>O/P: 5Vdc 3.0A 15W Max |

| Peripherals | Brand | Model No. | Serial No. | Data cable |
|---|---|---|---|---|
| Notebook PC | HP | HP ProBook 440 G3 | 5CD8021S9H | USB to Micro USB cable 1 meter |

## 2. Test specifications

### 2.1 Introduction

The EUT operates in the 2.4 GHz and 5 GHz band. Due to the EUT (include antenna) at its normal operation distance is at least 20 cm from the human body, the EUT was defined as a Mobile Device.

The reason to do the MPE Evaluation is to avoid the RF hazard to human body. The maximum output power and gain of the antenna were used to calculate the limited Power density (S) at 20 cm distance away from the product. The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 and Safety Code 6 are followed.

According to 1.1307 (b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

### 2.2 RF Exposure Limit

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b) and KDB 447498 D01 General RF Exposure Guidance v06.

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm $^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| (i) Limits for Occupational/Controlled Exposure | | | | |
| 0.3-3.0 | 614 | 1.63 | *(100) | ≤6 |
| 3.0-30 | 1842/f | 4.89/f | *(900/f $^2$) | <6 |
| 30-300 | 61.4 | 0.163 | 1.0 | <6 |
| 300-1,500 | | | f/300 | <6 |
| 1,500-100,000 | | | 5 | <6 |
| (ii) Limits for General Population/Uncontrolled Exposure | | | | |
| 0.3-1.34 | 614 | 1.63 | *(100) | <30 |
| 1.34-30 | 824/f | 2.19/f | *(180/f $^2$) | <30 |
| 30-300 | 27.5 | 0.073 | 0.2 | <30 |
| 300-1,500 | | | f/1500 | <30 |
| 1,500-100,000 | | | 1.0 | <30 |

## SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

| MHz | 5 | 10 | 15 | 20 | 25 | mm |
|---|---|---|---|---|---|---|
| 150 | 39 | 77 | 116 | 155 | 194 | SAR Test Exclusion Threshold (mW) |
| 300 | 27 | 55 | 82 | 110 | 137 | |
| 450 | 22 | 45 | 67 | 89 | 112 | |
| 835 | 16 | 33 | 49 | 66 | 82 | |
| 900 | 16 | 32 | 47 | 63 | 79 | |
| 1500 | 12 | 24 | 37 | 49 | 61 | |
| 1900 | 11 | 22 | 33 | 44 | 54 | |
| 2450 | 10 | 19 | 29 | 38 | 48 | |
| 3600 | 8 | 16 | 24 | 32 | 40 | |
| 5200 | 7 | 13 | 20 | 26 | 33 | |
| 5400 | 6 | 13 | 19 | 26 | 32 | |
| 5800 | 6 | 12 | 19 | 25 | 31 | |

| MHz | 30 | 35 | 40 | 45 | 50 | mm |
|---|---|---|---|---|---|---|
| 150 | 232 | 271 | 310 | 349 | 387 | SAR Test Exclusion Threshold (mW) |
| 300 | 164 | 192 | 219 | 246 | 274 | |
| 450 | 134 | 157 | 179 | 201 | 224 | |
| 835 | 98 | 115 | 131 | 148 | 164 | |
| 900 | 95 | 111 | 126 | 142 | 158 | |
| 1500 | 73 | 86 | 98 | 110 | 122 | |
| 1900 | 65 | 76 | 87 | 98 | 109 | |
| 2450 | 57 | 67 | 77 | 86 | 96 | |
| 3600 | 47 | 55 | 63 | 71 | 79 | |
| 5200 | 39 | 46 | 53 | 59 | 66 | |
| 5400 | 39 | 45 | 52 | 58 | 65 | |
| 5800 | 37 | 44 | 50 | 56 | 62 | |

**Note**: 10-g Extremity SAR Test Exclusion Power Thresholds are 2.5 times higher than the 1-g SAR Test Exclusion Thresholds indicated above. These thresholds do not apply, by extrapolation or other means, to occupational exposure limits.

## SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and > 50 mm

Approximate SAR test exclusion power thresholds at selected frequencies and test separation distances are illustrated in the following table.

| MHz | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | mm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 474 | 481 | 487 | 494 | 501 | 507 | 514 | 521 | 527 | 534 | 541 | 547 | 554 | 561 | 567 | |
| 150 | 387 | 397 | 407 | 417 | 427 | 437 | 447 | 457 | 467 | 477 | 487 | 497 | 507 | 517 | 527 | |
| 300 | 274 | 294 | 314 | 334 | 354 | 374 | 394 | 414 | 434 | 454 | 474 | 494 | 514 | 534 | 554 | |
| 450 | 224 | 254 | 284 | 314 | 344 | 374 | 404 | 434 | 464 | 494 | 524 | 554 | 584 | 614 | 644 | |
| 835 | 164 | 220 | 275 | 331 | 387 | 442 | 498 | 554 | 609 | 665 | 721 | 776 | 832 | 888 | 943 | |
| 900 | 158 | 218 | 278 | 338 | 398 | 458 | 518 | 578 | 638 | 698 | 758 | 818 | 878 | 938 | 998 | |
| 1500 | 122 | 222 | 322 | 422 | 522 | 622 | 722 | 822 | 922 | 1022 | 1122 | 1222 | 1322 | 1422 | 1522 | mW |
| 1900 | 109 | 209 | 309 | 409 | 509 | 609 | 709 | 809 | 909 | 1009 | 1109 | 1209 | 1309 | 1409 | 1509 | |
| 2450 | 96 | 196 | 296 | 396 | 496 | 596 | 696 | 796 | 896 | 996 | 1096 | 1196 | 1296 | 1396 | 1496 | |
| 3600 | 79 | 179 | 279 | 379 | 479 | 579 | 679 | 779 | 879 | 979 | 1079 | 1179 | 1279 | 1379 | 1479 | |
| 5200 | 66 | 166 | 266 | 366 | 466 | 566 | 666 | 766 | 866 | 966 | 1066 | 1166 | 1266 | 1366 | 1466 | |
| 5400 | 65 | 165 | 265 | 365 | 465 | 565 | 665 | 765 | 865 | 965 | 1065 | 1165 | 1265 | 1365 | 1465 | |
| 5800 | 62 | 162 | 262 | 362 | 462 | 562 | 662 | 762 | 862 | 962 | 1062 | 1162 | 1262 | 1362 | 1462 | |

## SAR Test Exclusion Thresholds for < 100 MHz and < 200 mm

Approximate SAR test exclusion power thresholds at selected frequencies and test separation distances are illustrated in the following table.

| MHz | < 50 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | mm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 237 | 474 | 481 | 487 | 494 | 501 | 507 | 514 | 521 | 527 | 534 | 541 | 547 | 554 | 561 | 567 | |
| 50 | 308 | 617 | 625 | 634 | 643 | 651 | 660 | 669 | 677 | 686 | 695 | 703 | 712 | 721 | 729 | 738 | |
| 10 | 474 | 948 | 961 | 975 | 988 | 1001 | 1015 | 1028 | 1041 | 1055 | 1068 | 1081 | 1095 | 1108 | 1121 | 1135 | |
| 1 | 711 | 1422 | 1442 | 1462 | 1482 | 1502 | 1522 | 1542 | 1562 | 1582 | 1602 | 1622 | 1642 | 1662 | 1682 | 1702 | mW |
| 0.1 | 948 | 1896 | 1923 | 1949 | 1976 | 2003 | 2029 | 2056 | 2083 | 2109 | 2136 | 2163 | 2189 | 2216 | 2243 | 2269 | |
| 0.05 | 1019 | 2039 | 2067 | 2096 | 2125 | 2153 | 2182 | 2211 | 2239 | 2268 | 2297 | 2325 | 2354 | 2383 | 2411 | 2440 | |
| 0.01 | 1185 | 2370 | 2403 | 2437 | 2470 | 2503 | 2537 | 2570 | 2603 | 2637 | 2670 | 2703 | 2737 | 2770 | 2803 | 2837 | |

## 2.3 RF Exposure calculations

From §FCC 1.1310 table 1, the maximum permissible RF exposure for an uncontrolled environment is 1 mW/($cm^2$) (or 10 W/$m^2$)*

Power density (S) is calculated by the following formula:

$S = (P * G)/4\pi R^2$

where, S = Power density (mW/$cm^2$)
P = Output power to antenna (mW)
R = Distance between radiating structure and observation point (cm)
G = Gain of antenna in numeric
$\pi$ = 3.1416

Example:
Assume a mobile device operates at 2412MHz and its maximum output power is 50mW, and the maximum gain of antenna is 1 (numeric) /0dBi.

then the power density (S) = $(50 * 1)/4*\pi*20^2$ = 0.00995 (mW/$cm^2$) (or = 0.0995 W/$m^2$)

## 2.4 Operation mode

The EUT was supplied with DC 5 V from Adapter (Test voltage: 120Vac, 60Hz).

The EUT connected to Notebook PC, executing “CMD” and select different frequency and modulation.

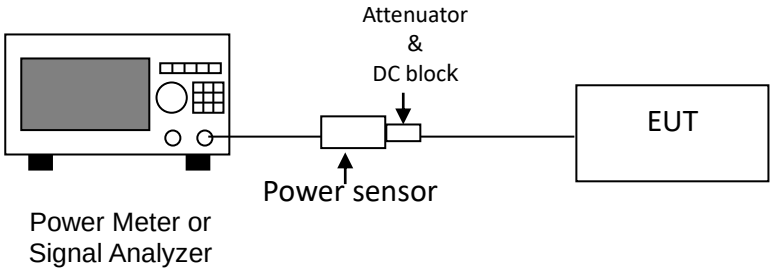
With individual verifying, the maximum output power were found out 1 Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 13 Mbps data rate for 802.11n(HT20) mode , the final tests were executed under these conditions recorded in this report individually.

With individual verifying, the maximum output power were found out 6 Mbps data rate for 802.11a mode, 13 Mbps data rate for 802.11ac(VHT20) mode, 27 Mbps data rate for 802.11ac(VHT40) mode , 58.5 Mbps data rate for 802.11ac(VHT80) mode, the final tests were executed under these conditions recorded in this report individually.

## 2.5 Test equipment

| Equipment | Brand | Model No. | Serial No. | Calibration Date | Next Calibration Date |
|---|---|---|---|---|---|
| Power Meter | Anritsu | ML2495A | 0844001 | 2020/10/28 | 2021/10/27 |
| Power Sensor | Anritsu | MA2411B | 0738452 | 2020/10/28 | 2021/10/27 |
| Signal Analyzer | Agilent | N9030A | MY51380492 | 2020/08/17 | 2021/08/16 |

## 2.6 Test Set-up



## 3. Test results

| | |
|---|---|
| Temperature (℃) : | 27 |
| Relative Humidity (%) : | 61 |
| Test date : | 2021/8/11 |

| Mode | Ch. | Freq. (MHz) | Antenna Gain0 (mW) | Output power to antenna 0 (dBm) | Antenna Gain1 (mW) | Output power to antenna 1 (dBm) | Tune-up Power Tolerance (dB) | Max Tune-up Power to antenna 0 (dBm) | Max Tune-up Power to antenna 1 (dBm) | Max Tune-up Power to antenna 0 (mW) | Max Tune-up Power to antenna1 (mW) | Power density0 (mW/cm²) | Power density1 (mW/cm²) | Total Power density (mW/cm²) | Limit of power density (mW/cm²) | MPE ratios |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11b Chain0+1 | 1 | 2412 | 2.00 | 20.44 | 2.00 | 21.71 | 2.00 | 22.44 | 23.71 | 175.39 | 234.96 | 0.0696 | 0.0933 | 0.1629 | 1.0 | 0.1629 |
| | 6 | 2437 | 2.00 | 21.28 | 2.00 | 20.34 | 2.00 | 23.28 | 22.34 | 212.81 | 171.40 | 0.0845 | 0.0680 | 0.1525 | 1.0 | 0.1525 |
| | 11 | 2462 | 2.00 | 21.19 | 2.00 | 21.35 | 2.00 | 23.19 | 23.35 | 208.45 | 216.27 | 0.0827 | 0.0858 | 0.1686 | 1.0 | 0.1686 |
| 802.11g Chain0+1 | 1 | 2412 | 2.00 | 24.22 | 2.00 | 23.73 | 2.00 | 26.22 | 25.73 | 418.79 | 374.11 | 0.1662 | 0.1485 | 0.3147 | 1.0 | 0.3147 |
| | 6 | 2437 | 2.00 | 24.99 | 2.00 | 24.39 | 2.00 | 26.99 | 26.39 | 500.03 | 435.51 | 0.1985 | 0.1729 | 0.3714 | 1.0 | 0.3714 |
| | 11 | 2462 | 2.00 | 23.25 | 2.00 | 23.26 | 2.00 | 25.25 | 25.26 | 334.97 | 335.74 | 0.1330 | 0.1333 | 0.2662 | 1.0 | 0.2662 |
| 802.11n (HT20) Chain0+1 | 1 | 2412 | 2.00 | 25.18 | 2.00 | 24.49 | 2.00 | 27.18 | 26.49 | 522.40 | 445.66 | 0.2074 | 0.1769 | 0.3843 | 1.0 | 0.3843 |
| | 6 | 2437 | 2.00 | 24.30 | 2.00 | 23.05 | 2.00 | 26.30 | 25.05 | 426.58 | 319.89 | 0.1693 | 0.1270 | 0.2963 | 1.0 | 0.2963 |
| | 11 | 2462 | 2.00 | 23.07 | 2.00 | 22.79 | 2.00 | 25.07 | 24.79 | 321.37 | 301.30 | 0.1276 | 0.1196 | 0.2472 | 1.0 | 0.2472 |

The Notice in Installation Manual has been stated as below:
While installing and operating this transmitter, the radio frequency exposure limit of 1 mW/ ($cm^2$) may be exceeded at distances close to the transmitter. Therefore, the user must maintain a minimum distance of 20 cm from the device at all time.

| | |
|---|---|
| Temperature (℃) : | 27 |
| Relative Humidity (%) : | 61 |
| Test date : | 2021/8/11 |

| Mode | Ch. | Freq. (MHz) | Antenna0 Gain (mW) | Output power to antenna 0 (dBm) | Antenna1 Gain (mW) | Output power to antenna 1 (dBm) | Tune-up Power Tolerance (dB) | Max Tune-up Power to antenna 0 (dBm) | Max Tune-up Power to antenna 1 (dBm) | Max Tune-up Power to antenna 0 (mW) | Max Tune-up Power to antenna1 (mW) | Power density 0 (mW/cm²) | Power density 1 (mW/cm²) | Total power density (mW/cm²) | Limit of power density (mW/cm²) | MPE ratios |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11a Chain0+1 | 36 | 5180 | 2.00 | 19.68 | 2.00 | 18.82 | 2.00 | 21.68 | 20.82 | 147.23 | 120.78 | 0.0584 | 0.0479 | 0.1064 | 1.0 | 0.1064 |
| | 44 | 5220 | 2.00 | 19.12 | 2.00 | 19.00 | 2.00 | 21.12 | 21.00 | 129.42 | 125.89 | 0.0514 | 0.0500 | 0.1013 | 1.0 | 0.1013 |
| | 48 | 5240 | 2.00 | 19.43 | 2.00 | 19.85 | 2.00 | 21.43 | 21.85 | 139.00 | 153.11 | 0.0552 | 0.0608 | 0.1159 | 1.0 | 0.1159 |
| | 149 | 5745 | 2.00 | 19.67 | 2.00 | 19.50 | 2.00 | 21.67 | 21.50 | 146.89 | 141.25 | 0.0583 | 0.0561 | 0.1144 | 1.0 | 0.1144 |
| | 157 | 5785 | 2.00 | 20.16 | 2.00 | 19.47 | 2.00 | 22.16 | 21.47 | 164.44 | 140.28 | 0.0653 | 0.0557 | 0.1210 | 1.0 | 0.1210 |
| | 165 | 5825 | 2.00 | 20.20 | 2.00 | 19.94 | 2.00 | 22.20 | 21.94 | 165.96 | 156.31 | 0.0659 | 0.0620 | 0.1279 | 1.0 | 0.1279 |
| 802.11ac (VHT20) Chain0+1 | 36 | 5180 | 2.00 | 18.58 | 2.00 | 18.61 | 2.00 | 20.58 | 20.61 | 114.29 | 115.08 | 0.0454 | 0.0457 | 0.0910 | 1.0 | 0.0910 |
| | 44 | 5220 | 2.00 | 18.57 | 2.00 | 18.18 | 2.00 | 20.57 | 20.18 | 114.02 | 104.23 | 0.0453 | 0.0414 | 0.0866 | 1.0 | 0.0866 |
| | 48 | 5240 | 2.00 | 18.38 | 2.00 | 18.39 | 2.00 | 20.38 | 20.39 | 109.14 | 109.40 | 0.0433 | 0.0434 | 0.0867 | 1.0 | 0.0867 |
| | 149 | 5745 | 2.00 | 18.53 | 2.00 | 18.24 | 2.00 | 20.53 | 20.24 | 112.98 | 105.68 | 0.0448 | 0.0419 | 0.0868 | 1.0 | 0.0868 |
| | 157 | 5785 | 2.00 | 19.13 | 2.00 | 18.33 | 2.00 | 21.13 | 20.33 | 129.72 | 107.89 | 0.0515 | 0.0428 | 0.0943 | 1.0 | 0.0943 |
| | 165 | 5825 | 2.00 | 18.80 | 2.00 | 18.20 | 2.00 | 20.80 | 20.20 | 120.23 | 104.71 | 0.0477 | 0.0416 | 0.0893 | 1.0 | 0.0893 |
| 802.11ac (VHT40) Chain0+1 | 38 | 5190 | 2.00 | 15.83 | 2.00 | 15.38 | 2.00 | 17.83 | 17.38 | 60.67 | 54.70 | 0.0241 | 0.0217 | 0.0458 | 1.0 | 0.0458 |
| | 46 | 5230 | 2.00 | 15.94 | 2.00 | 15.61 | 2.00 | 17.94 | 17.61 | 62.23 | 57.68 | 0.0247 | 0.0229 | 0.0476 | 1.0 | 0.0476 |
| | 151 | 5755 | 2.00 | 16.14 | 2.00 | 16.39 | 2.00 | 18.14 | 18.39 | 65.16 | 69.02 | 0.0259 | 0.0274 | 0.0533 | 1.0 | 0.0533 |
| | 159 | 5795 | 2.00 | 16.34 | 2.00 | 16.31 | 2.00 | 18.34 | 18.31 | 68.23 | 67.76 | 0.0271 | 0.0269 | 0.0540 | 1.0 | 0.0540 |
| 802.11ac (VHT80) Chain0+1 | 42 | 5210 | 2.00 | 15.14 | 2.00 | 14.29 | 2.00 | 17.14 | 16.29 | 51.76 | 42.56 | 0.0205 | 0.0169 | 0.0374 | 1.0 | 0.0374 |
| | 155 | 5775 | 2.00 | 14.51 | 2.00 | 14.92 | 2.00 | 16.51 | 16.92 | 44.77 | 49.20 | 0.0178 | 0.0195 | 0.0373 | 1.0 | 0.0373 |

The Notice in Installation Manual has been stated as below:
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